Positive attitudes of French general practitioners towards A/H1N1 influenza-pandemic vaccination: a missed opportunity to increase vaccination uptakes in the general public?

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Positive attitudes of French general practitioners towards A/H1N1 influenza pandemic vaccination: a missed opportunity to increase vaccination uptakes in the general public?

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Summary: Attitudes of general practitioners (GPs) towards A/H1N1 pandemic vaccination are unknown. We conducted a cross-sectional survey with computer-assisted telephone interviewing in the French Regional Panel of General Practices from June 16 to September 22, 2009. Of 1,434 respondents representative of GPs in four French regions, 885 (61.7%) were willing to accept A/H1N1 pandemic vaccination for themselves. The personal history of seasonal flu vaccination was the strongest independent predictive factor of willingness to accept A/H1N1 pandemic vaccination (P<.0001). GPs receiving seasonal vaccines every year were more likely to accept A/H1N1 pandemic vaccination than those who were never vaccinated in the prior three years (adjusted OR=4.38; 95% CI, 2.44 to 4.67). Willingness to accept pandemic vaccination was also significantly associated with being on call for emergencies; positive attitudes towards other protective measures against A/H1N1 influenza virus in the practice; and a higher readiness to provide additional consultations in response to the pandemic. In conclusion, GPs showed a high acceptability of A/H1N1 pandemic vaccination. GPs' involvement in the mass vaccination campaign, which has been neglected by French public health authorities, may have increased uptake rates in the general public.

Keywords: pandemic vaccination; influenza; healthcare workers; general practice

Running headline: Acceptability of pandemic vaccination among GPs

Introduction

On June 11, 2009, the World Health Organization (WHO) declared a pandemic due to the novel A/H1N1 2009 influenza virus [1]. Forty countries embarked thereafter in national A/H1N1 pandemic vaccination campaigns to mitigate the transmission of the virus [2]. In France, with a population of around 63.5 million, the government bought 94 million doses of A/H1N1 pandemic vaccines [3]. On October 20, the distribution of available vaccine supply started in hospitals for 1.2 million healthcare workers including doctors and nurses of primary care settings [4, 5]. On November 12, the access to vaccines was extended in mass vaccination centres to 2.8 million at-risk people aged 6 months to 64 years, 1.7 million household contacts and caregivers for children younger than 6 months of age, and 880,000 additional healthcare workers in primary care settings [4, 5]. Contrary to the seasonal flu vaccine that is usually prescribed and administered by general practitioners (GPs) in ambulatory medicine, GPs have not been allowed to participate in the pandemic vaccination campaign for logistical reasons. The French situation is in sharp contrast with neighbouring countries where GPs administer pandemic vaccines in accordance with their pivotal role in seasonal influenza vaccination campaigns, like in Belgium, or even receive financial incentives to vaccinate people at risk, like in the UK [6]. As of November 22nd, pandemic vaccine uptake rates remained below 10% in both hospitals and mass vaccination centres [7], although the A/H1N1 pandemic outbreak had already been responsible for 357 hospitalizations of severe diseases and 68 deaths [8].

The initial low uptake rates observed in France may largely be attributable to the ongoing public controversy about the safety of new pandemic vaccines and the rationale for mass vaccination of the whole population [9-14]. As a consequence, the general public including people identified as being at risk may increasingly look for advice from their GPs. Previous studies have shown that GPs' personal behaviours and attitudes towards seasonal influenza

vaccination are associated strongly with their patients' immunization behaviour [15-18]. Accordingly, French GPs' counselling to their clientele, and to the general public as a whole, may have a significant influence on the public acceptability of the mass vaccination campaign. A better understanding of GPs attitudes and behaviours toward A/H1N1 pandemic vaccination is therefore of utmost importance.

We conducted a telephone survey among a representative sample of GPs in four French regions between June 16 and September 22, 2009, to evaluate their willingness to accept A/H1N1 pandemic vaccination for themselves. We investigated how a variety of factors, including individual and occupational characteristics as well as personal history of seasonal influenza vaccination receipt, may affect GPs' willingness to accept A/H1N1 pandemic vaccination for themselves. We also investigated the relationships between GPs' attitudes towards pandemic vaccination and their attitudes towards other protective measures against A/H1N1 2009 influenza virus in the practice and their readiness to provide additional consultations in response to the pandemic.

Methods

Participants

The present study was part of the fifth cross-sectional survey conducted in the frame of the French Regional Panel of General Practices. This Panel survey was initiated in March 2007 with the objective to study medical practice of French GPs who account for 56% of ambulatory physicians [19, 20]. Four regions were selected as a function of their diverse medical density: Lower Normandy, Burgundy, Brittany and Provence-Alpes-Côte d'Azur (called South-Eastern region in the following) with ratios of 96, 101, 107, and 136 GPs per 100,000 inhabitants, respectively [21]. GPs were selected for stratified random sampling from the ADELI ("Automatisation DEs LIstes") database of the Ministry of Health which contains exhaustive information on French physicians. The ADELI database was stratified for region, location of the general practice (in urban, suburban or rural areas), gender, and age (<45; 45 to 52; >52). GPs practicing exclusively in hospitals or long term care facilities, GPs practicing exclusively alternative medicines (such as homeopathy or acupuncture), GPs who were not practicing at time of the survey due to sick leave or retirement, and GPs planning to move out of their present region in the next six months were excluded. GPs received a compensation equivalent to 2 consultation fees for their participation to each cross-sectional survey. Participant GPs, who dropped out in a following cross-sectional survey, were randomly replaced according to their stratum.

Of the 2,498 eligible GPs invited to participate to the French Regional Panel of General Practices in March 2007, 1,451 (58.1%) gave their agreement to participate. The 1,047 GPs who refused to participate did not differ from participants according to practice location and gender, but they were older (P=.02). Lack of time was their main reason for refusal. Results presented in this paper are based on the 1,434 panel GPs who participated to the fifth cross-

sectional survey conducted between June 16 and September 22, 2009 (response rate of 1,434/1,451; 98.8%).

Procedure and questionnaire

The survey was conducted among GPs by professional investigators with computer-assisted telephone interviewing. The questionnaire was pilot-tested for clarity, length and face validity among 20 GPs.

Respondents were asked whether or not they would accept the A/H1N1 pandemic vaccination for themselves as soon as it became available. In addition, they were asked to assess the importance of other protective measures against A/H1N1 2009 influenza virus in the practice on a 10-point scale from 1 "not important at all" to 10 "of utmost importance": 1) to wear a facial mask during each clinical encounter with patients; 2) to provide facial masks to all patients and having them wear it in the practice; 3) to recommend patients with influenza-like illness to stay at home and to visit them at home for medical care. A total score of importance of A/H1N1 protective measures was also computed by aggregating the answers to these three items [min=3 to max=30].

Moreover, respondents were asked what was the maximum number of additional consultations they would be ready to provide per day at the peak of the influenza-pandemic to care for patients with flu or to vaccinate the population. Respondents were asked how many times they had been vaccinated against seasonal influenza in the prior three years (each year, twice, once, never); whether they had read the "national plan for influenza-pandemic preparedness and response" (yes/no); and whether the primary objective of pandemic vaccination should be "to protect individuals at higher risk for influenza complications" or "to mitigate the transmission of influenza virus in the whole population".

The questionnaire also collected data on individual and occupational characteristics of respondents: gender and age; solo or group practice; being on call for emergencies; working part-time in long term care facilities or in hospitals in addition to their ambulatory practice; practicing some alternative medicine such as homeopathy; participating in Continuing Medical Education during the previous year (CME); payment scheme for consultation (Social Security fixed fees or free pricing). Observational data on GP's activity in 2007 and 2008 was obtained, in parallel to the survey, from the Social Security exhaustive reimbursement database that includes for each GP the total number of consultations and home visits per year, and the age distribution of the GP's clientele according to four age categories (less than 16; 16 to 59; 60 to 70; more than 70).

The survey was approved by the National Data Protection Authority (Commission Nationale Informatique et Libertés/ CNIL) which is in charge of ethical issues and protection of individual data collection in France.

Statistical analysis

The main outcome variable was GP's willingness to accept A/H1N1 pandemic vaccination for themselves (yes versus no or don't know). Univariate associations between respondent's willingness to accept A/H1N1 pandemic vaccination and other variables were tested using logistic regression. Explanatory variables, that were related to willingness to accept A/H1N1 pandemic vaccination at the $p \leq .15$ level, were subsequently introduced in a backward multivariate logistic model (p exit>.05) to identify independent predictive factors for such willingness. Region, location of general practice, gender, and age were forced in the final regression model since these variables had been used to stratify the sample. Adjusted odds ratios and 95% confidence intervals were presented for the main findings. Data were analysed using SAS 9.1.3 (SAS Institute, Cary NC).

Results

Individual and occupational characteristics of the 1,434 GPs who participated in the survey, as well as characteristics of their practice, are detailed in Table 1. A total of 885 respondents (61.7%) declared their willingness to accept A/H1N1 pandemic vaccination for themselves as soon as it became available, while an even higher proportion (70.6%) had systematically been vaccinated for seasonal influenza in the prior three years (Table 2). On average, GPs were ready to increase their workload in response to the pandemic by undertaking 11.6 (sd = 6.5) consultations per day in addition to their usual practice activity. A large majority of respondents agreed that the main objective of pandemic vaccination was the public health goal to mitigate the transmission of the influenza virus in the whole population and had some knowledge of the national preparedness plan against an influenza-pandemic. Respectively, 36.8%, 39.5%, and 38.9% declared that it was "of utmost importance" (score = 10) that the GP wears a facial protective mask with each patient; orders patient to wear facial masks in the practice; and recommends influenza-ill patients to stay at home. Table 2 also presents the scores of importance that GPs associated with these three measures of protection against A/H1N1 2009 influenza virus in the practice.

Univariate analyses showed that willingness to accept A/H1N1 pandemic vaccination did not vary significantly according to the four individual characteristics used for stratification in the survey: region, location of general practice, gender, and age. Several occupational characteristics of GPs and their practice (working part-time in hospitals in parallel to their ambulatory practice; participating in CME; and type of payment scheme) were not associated with acceptability of A/H1N1 vaccination. Age distribution of GP's clientele was also not associated with their personal intention towards vaccination.

By contrast, as shown in Table 3, some GPs' characteristics were found to be significantly related to their willingness to accept A/H1N1 pandemic vaccination even after adjustment

through multivariate logistic analysis. GPs more willing to get vaccinated were those: working in group practices; being on call for emergencies; working part-time in long term care facilities (usually for the elderly) in parallel to their ambulatory practice; and having the highest workload in practice (more than 4000 consultations per year). Quite logically, GPs who were more ready to increase their workload in response to the pandemic, who adhered the most to implementing other protective measures in their practice, and who believed that mitigation of transmission of the influenza virus in the whole population was the primary objective of pandemic vaccination were also more willing to accept A/H1N1 pandemic vaccination for themselves. The multivariate logistic analysis presented in Table 3 highlights that history of seasonal flu vaccination in the prior three years was the strongest predictive factor of willingness to accept A/H1N1 pandemic vaccination. This willingness increased significantly with the number of seasonal flu vaccines received in the prior three years (Cochran-Armitage test for trend: P<.0001).

Discussion

This survey was conducted during the summer of 2009 among a sample of 1,434 GPs representative of all GPs in ambulatory medicine in four French regions and revealed quite a high acceptability of A/H1N1 pandemic vaccination in this professional group. A large majority of GPs (61.7%) were willing to accept such vaccination for themselves as soon as it became available. To our knowledge, no other study had explored the willingness to accept A/H1N1 pandemic vaccination in general ambulatory practice since WHO declared the A/H1N1 influenza-pandemic. Only one study was conducted among 389 healthcare workers, but in the quite different context of Hong Kong public hospitals, and found that less than half (47.9%) were willing to accept A/H1N1 pandemic vaccination in May 2009 [22].

The positive attitude of French GPs towards A/H1N1 pandemic vaccination is coherent with previous observed behaviours of GPs towards seasonal influenza vaccination. Seasonal influenza vaccination has been recommended for more than 25 years to all healthcare workers, but average uptake rates have remained quite low, usually close to 20% in most countries [18, 23]. However, the few surveys carried out among GPs suggest a higher acceptability of seasonal vaccination in this professional group. Two cross-sectional studies conducted among GPs in France and the Belgian French community found uptake rates at about 66% in the previous influenza season [24, 25], while other studies provided estimates ranging from 36% to 82% [16, 26-28]. In our survey, 70.6% of GPs had received the seasonal influenza vaccine every year in the prior three years and their personal history of seasonal vaccination receipt was strongly related to their acceptability of the A/H1N1 pandemic vaccination with a significant trend towards an exposure-effect relationship. Previous studies conducted among healthcare workers showed a similar relationship between the receipt of influenza vaccine in the previous season and willingness to accept: 1) seasonal influenza vaccine in general practice [27, 28], hospitals [29], and long term care facilities [30, 31]; 2)

pre-pandemic A/H5N1 influenza vaccines in hospitals [22, 32]; and 3) A/H1N1 influenza pandemic vaccines in hospitals [22]. In addition, previous receipt of seasonal flu vaccines was associated with willingness to accept unapproved influenza-pandemic vaccination in June 2009 among the general public in the US [14].

The quite high personal uptake rate of seasonal influenza vaccination among French GPs is assumingly related to their pivotal role in the management of seasonal influenza. French GPs care for patients with influenza-like illnesses and are thus highly exposed to the virus [33], and they are mostly in charge of the vaccination of the elderly and of patients at higher risk for influenza complications [18]. Similarly, the higher willingness observed in GPs being on call for emergencies, having already higher workloads, and working in group practices suggests that these primary care physicians may have a higher perception of the risk of being exposed to A/H1N1 2009 influenza virus and/or a higher consciousness of their public health responsibilities in case of an influenza-pandemic. Also, the higher willingness observed in GPs having a part-time activity in long term care facilities suggests that GPs have more experience vaccinating the elderly against seasonal influenza, and may therefore be more willing to vaccinate in general because of an increased comfort level.

French GPs' experience with management of seasonal influenza seems to translate into a positive attitude towards A/H1N1 pandemic vaccination and a high willingness to contribute to the public health mobilization against the A/H1N1 influenza-pandemic. GPs who accepted pandemic vaccination for themselves were also more likely to be informed of the national preparedness plan against an influenza-pandemic, to support mass vaccination to mitigate the transmission of the virus, and to take an active role against the influenza-pandemic by recommending protective behaviours to their patients and by increasing their workload in practices. Accordingly, the decision of French public authorities not to allow GPs to actively

participate in the mass vaccination campaign may have disregarded a significant public health potential to increase vaccination uptakes in the general public.

While the clinical severity of A/H1N1 2009 influenza-pandemic appeared lower in the Southern Hemisphere during the summer [34, 35], the public media attention shifted towards the safety of A/H1N1 pandemic vaccines with regard to the risk of Guillain-Barré syndrome as observed during the 1976 swine flu vaccination campaign in the United States [9], the unknown safety of adjuvanted vaccines, the unclear number of vaccine injections needed for efficacy, the accelerated authorization procedure to market pandemic vaccines, and actual motivations of pharmaceutical firms. Several opinion leaders and politicians reinforced this negative trend of attitudes towards vaccination by criticizing French public authorities regarding a communication strategy "overstressing potential health risks of the influenza-pandemic". In a qualitative study among healthcare workers and the general public, Henrich and Holmes found that individuals were hesitant to accept pandemic vaccines and that "concerns about using new vaccines during a pandemic differ from concerns about using established products in non-crisis situations" [13]. In such context of negative messages about the pandemic vaccination, the success of the mass vaccination campaign may partly rely on GPs' capacity to advise the general public in favour of pandemic vaccination since GPs' behaviours and attitudes towards seasonal influenza vaccination have already been shown to associate with patient immunization behaviour [15-18].

Some limitations of our study should be acknowledged. First, our sample only covered four French regions and not the whole country. However, it was carried out in the frame of the French Regional Panel of General Practices providing a global picture of French ambulatory medicine from regions of contrasted density of GPs; socio-professional characteristics of GPs were similar to those observed at the national level [21]. In addition, our sample of GPs was stratified for four individual characteristics (i.e., region, location of general practices, gender,

and age), and none was found to be associated with willingness to accept A/H1N1 pandemic vaccination. Accordingly, the study results may apply more broadly to French GPs. Second, this survey was carried out before the pandemic vaccine was available and consequently before the vaccination started among health care workers included as the first priority group for vaccination. Thus, acceptability of A/H1N1 vaccine was measured through attitudes and declared intentions rather than observed actual behaviours. However, the strong relationship between previous behaviours towards seasonal influenza vaccination and acceptability of A/H1N1 pandemic vaccine suggests that it may adequately reflect effective uptake rates in GPs. Third, while the personal history of seasonal influenza vaccination receipt was self-reported, the verification of medical records could have dismissed a possible social desirability bias.

One month after the mass A/H1N1 pandemic vaccination campaign started in France on October 20, uptake rates remained below 10% among hospital healthcare workers. Since then, in parallel to an increase in the number of hospitalizations due to severe complications of A/H1N1 influenza, uptake rates have increased among both health care professionals and the general public. As of January 4th, 2010, about 5 million people (7.9% coverage) have been vaccinated in France [36]. Our survey however suggests that French public authorities may have made a mistake by not involving directly their GPs in the mass vaccination campaign and should urgently consider revising this policy.

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Table 1. Individual and occupational characteristics of French GPs participating in the survey about A/H1N1 influenza pandemic (N=1,434, June 16 to September 22, 2009).*

Characteristics	
Gender	
Male	1,063 (74.1)
Female	371 (25.9)
Age, mean (SD), year	49.8 (7.6)
Region	
South-Eastern France	585 (40.8)
Brittany	388 (27.0)
Burgundy	265 (18.5)
Lower Normandy	196 (13.7)
Location of general practice	
Urban	903 (63.0)
Rural	307 (21.4)
Suburban	224 (15.6)
Practice type	
Solo	766 (46.6)
Group	668 (53.4)
On call for emergencies	
No	779 (54.3)
Yes	655 (45.7)
Part-time activity in long term care facilities	
No	925 (64.5)
Yes	509 (35.5)
Part-time activity in hospitals	
No	1,224 (85.4)
Yes	210 (14.6)
Practicing some alternative medicine (homeopathy)	
No	1,357 (94.6)
Yes	77 (5.4)
Participation to Continuing Medical Education in the past year	
No	247 (16.5)
Yes	1,197 (83.5)
Payment scheme (fee-for-service)	
Social Security Fixed price	1,326 (92.5)
Free pricing	108 (7.5)
Consultations and home visits in 2007-2008, mean (SD), total per year	4,864 (2103)
Age distribution of GP's clientele in percentage	
Patients < 16 years old in 2007-2008, mean (SD)	19.9 (6.7)
Patients 60-69 years old in 2007-2008, mean (SD)	9.7 (3.1)
Patients > 70 years old in 2007-2008, mean (SD)	15.2 (7.4)

* Values are numbers (percentage) of respondents, except where stated otherwise.

Table 2. Beliefs, attitudes, and opinions of French GPs toward the A/H1N1 influenza-pandemic (N=1,434).*

Characteristics	
Willingness of GPs to accept A/H1N1 pandemic vaccination for themselves	
Yes	885 (61.7)
No	474 (33.1)
Don't know	75 (5.2)
Had been vaccinated against seasonal influenza in the prior three years	
Every year	1,013 (70.6)
Twice	110 (7.7)
Once	90 (6.3)
Never	221(15.4)
Has read the national preparedness plan against an influenza-pandemic	
Yes	1,238 (86.3)
No	196 (13.7)
Primary objective of influenza-pandemic vaccination	
To limit the transmission of the virus in the whole population	1,071 (74.7)
To protect individuals at higher risk for influenza complications	363 (25.3)
Score of importance of protective measures against A/H1N1 pandemic, mean (SD), (1-10) score†	
Wearing a facial mask with each patient	7.0 (3.2)
Ordering patients to wear a facial mask in the practice	7.1 (3.2)
Recommending patients with flu to stay at home	7.2 (3.1)
Total score of importance of 3 protective measures against A/H1N1 pandemic, mean (SD), (3-30) score	21.3 (6.6)
Additional workload to respond to A/H1N1 influenza pandemic, mean (SD), max number of consultations per day	11.6 (6.5)

* Values are numbers (percentage) of respondents, except where stated otherwise.

†Score ranging from 1 (not important at all) to 10 (of utmost importance)

Table 3. Factors associated with willingness of GPs to accept A/H1N1 pandemic vaccination for themselves: univariate and multivariate logistic models (N=1,434 GPs)

Variables and variable levels†	No (%) willing to accept pandemic vaccination	Unadjusted odds ratio	p value	Adjusted odds ratio (95% CI)‡	p value
Practice type					
Solo	428 (55.9)	1 [reference]		1 [reference]	
Group	457 (68.4)	1.71	<.0001	1.39 (1.10 to 1.77)	.006
On call for emergencies					
No	421 (54.0)	1 [reference]		1 [reference]	
Yes	464 (70.8)	2.07	<.0001	1.94 (1.50 to 2.51)	<.0001
Part-time activity in long term care facilities					
No	531 (57.4)	1 [reference]		1 [reference]	
Yes	354 (69.6)	1.70	<.0001	1.44 (1.11 to 1.86)	.006
Practicing some alternative medicine (homeopathy)					
No	852 (62.8)	1 [reference]		--	
Yes	33 (42.9)	0.45	.001		
Participation to Continuing Medical Education in the past year					
No	197 (57.3)	1 [reference]		--	
Yes	688 (63.1)	1.28	.052		
Total number of consultations and home visits in 2007-2008*					
<= 4,000 per year	264 (54.0)	1 [reference]		1 [reference]	
> 4,000 total per year	621 (65.7)	1.63	<.001	1.38 (1.06 to 1.78)	.015
Had been vaccinated against seasonal influenza in the prior three years					
Never	84 (38.0)	1 [reference]	(<.0001)	1 [reference]	(<.0001)
Once	43 (47.8)	1.49	.113	1.54 (0.91 to 2.62)	.107
Twice	68 (61.8)	2.64	<.0001	2.61 (1.58 to 4.30)	<.001
Every year	690 (68.1)	3.48	<.0001	3.38 (2.44 to 4.67)	<.0001
Has read the national preparedness plan against an influenza-pandemic					
No	105 (53.6)	1 [reference]		--	
Yes	780 (63.0)	1.48	.012		
Primary objective of influenza-pandemic vaccination					
To protect individuals at higher risk for influenza complications	195 (53.7)	1 [reference]		1 [reference]	
To limit the transmission of the virus in the whole population	690 (64.4)	1.56	.001	1.44 (1.11 to 1.87)	.007
Total score of importance of protective measures against A/H1N1 influenza pandemic*					
<= 20	295 (51.0)	1 [reference]		1 [reference]	
> 20	590 (69.0)	2.14	<.0001	2.34 (1.85 to 2.96)	<.0001
Readiness to provide additional consultations in response to A/H1N1 influenza pandemic*					
<= 10 consultations per day	572 (59.1)	1 [reference]		1 [reference]	
> 10 consultations per day	313 (67.2)	1.41	.002	1.39 (1.10 to 1.77)	.007

* Continuous variables were also significantly associated to willingness to accept A/H1N1 pandemic vaccination in the multivariate logistic model and were dichotomized at the median value for presentation of the final multivariate model

† Only variables associated with willingness to accept A/H1N1 pandemic vaccination at the p≤.15 level in univariate analysis are shown

‡ Adjusted odds ratio were also controlled for region, location of general practice, gender, and age used to stratify the sample; these variables were not significant in univariate analyses (p=.377; p=.835; p=.266; and p=.281, respectively). Hosmer-Lemeshow test: P=.78, suggests that the goodness of fit was adequate for the final